



## 1108L Analog Output Module

Revision 1.0



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## This Manual

This manual provides any required information for installation, configuration and operation of the Nico Technology Ltd. 1108L Analog Output Module.

It exclusively treats the handling of this device. It neither describes the LonWorks technology by Echelon nor the LonMark profile implemented in detail. More specific information concerning these subjects can be found in the documentation of Echelon ([www.echelon.com](http://www.echelon.com)) and the LonMark Interoperability Association ([www.lonmark.org](http://www.lonmark.org)).

The first part of this manual provides a survey about the device and its installation in chapters 1 to 3. The 2<sup>nd</sup> part describes the implemented application for lighting control and its configuration possibilities. Chapter 4 contains a description of the firmware interface while chapter 5 describes the implemented LonMark Objects in detail providing an outlook of the individual objects, their tasks and their relevant configuration parameters.

Chapter 6 explains the basics required to connect the objects to each other.

This manual is relevant for all variants of the Nico Technology Ltd. 1108L Analog Output Module where applications for building automation control are implemented.

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## 2 Product Information

### 2.1 Functional Elements

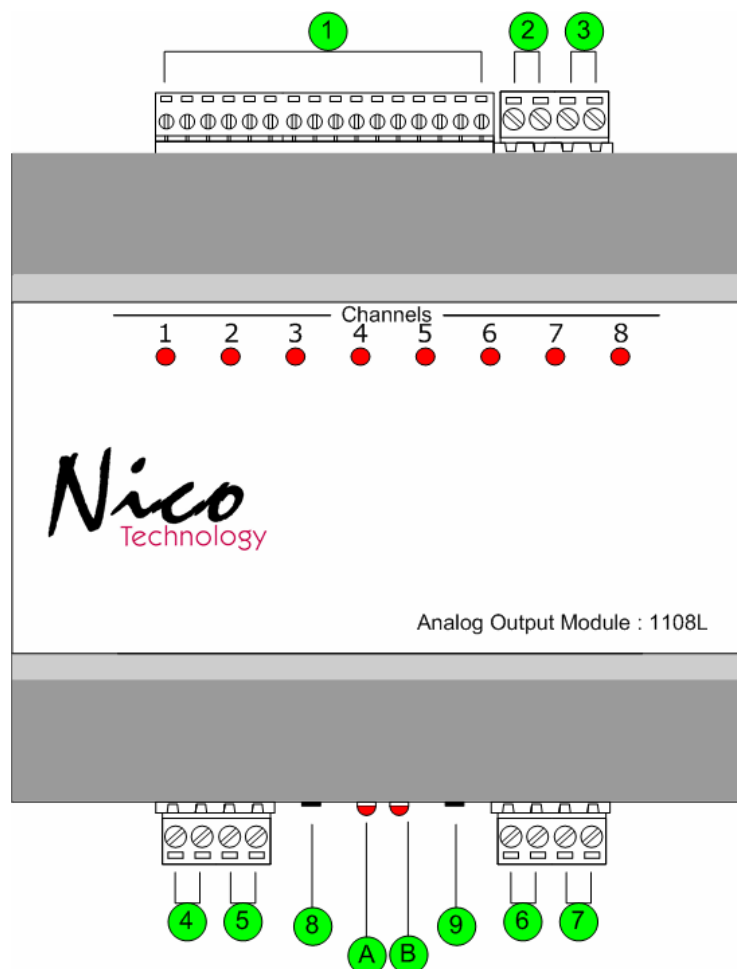


Figure 1.1 1108L Analog Output Module

No	Description
1	Output channels for 0~10VDC
2,3	24VDC Input power
4	T1,T2 for Connect to LonWorks network
5	24VDC Input power
6	T1,T2 for Connect to LonWorks network
7	24VDC Input power
8	Service Pin button
9	Reset button
A	Service Pin LED indicator
B	Reset LED indicator

### 3 Installation

This chapter first describes the installation of the device; the installation of the configuration software is described in section 3.4.

#### 3.1 Warnings

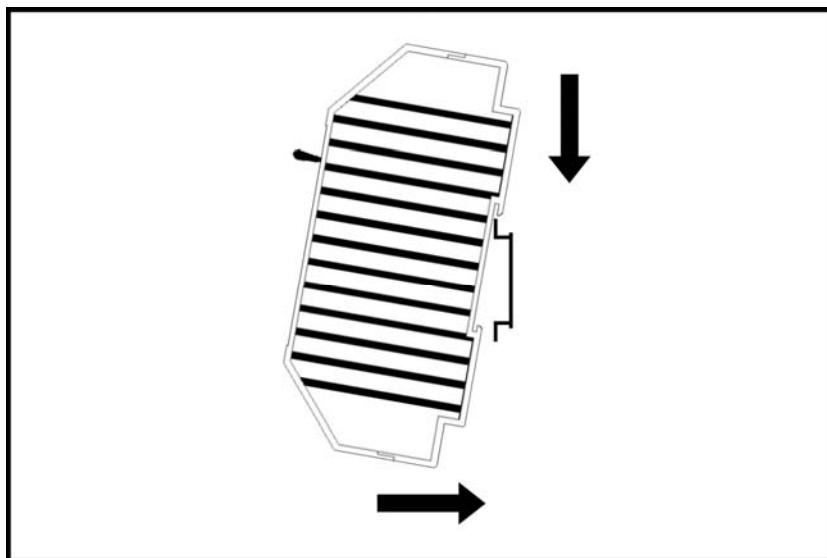
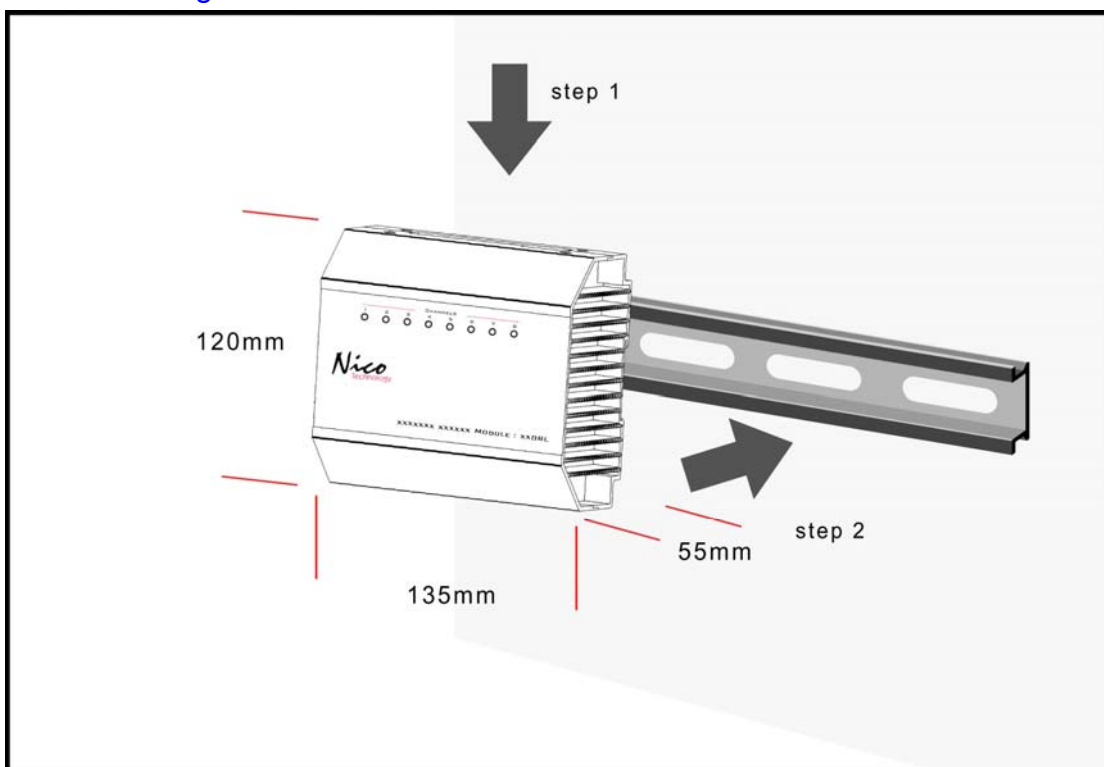
##### Attention

The device must be installed in compliance with the relevant DIN/VDE regulations or the relevant national standards. The connection to the supply voltage must be performed in accordance with VDE 0100 and VDE 0160 or the relevant national standards. Installation should perform by qualified and technical experienced personnel only.

##### CAUTION

At the connections of the output channels 1 – 4 (Fig. 1.1, terminal **1**) and the power supply (terminals **2, 3, 5, 7**) 24VDC main voltage with load guard band is accessible. The installation of the unit therefore has to be effected in a switch cabinet or behind a respective cover.

### 3.2 Mounting



### 3.3 Connections

The 1108L Analog Output Module has to be connected to a 24VDC power supply and to the LonWorks network. According to the respective application peripheral equipment has to be connected to outputs.

**Attention**

Before connecting peripheral equipment the power supply device has to be switched off.

The connection is effected by means of the included plug-screw terminals.

Clamping range of the plug-screw terminals:

- DC power and network connections (terminals **2** , **3** , **4** , **5** , **6** , **7**): 3.0 mm
- Low voltage connections (terminals **1**): 2.4 mm

The pin assignment of the connections is described in chapter 3.1, also containing wiring details.

**Voltage**

The 24 Volt Direct Current connections are through connected in order to achieve easy wiring.

**LonWorks Network**

The connection to the LonWorks network is made by means of twisted-pair cables. The connection "shield" has to be connected to ground in order to achieve a reliable dissipation of over-voltage on the LON circuits.

**Analog Outputs**

The actors to be controlled are connected to the DC outputs. In each case the connection is effected terminal **1**).

**Attention**

The 1108L input power supply must be 24VDC power supply only.

**3.4 Software Installation**

The configuration software of the 1108L Analog Output Module has to be installed by starting the program Setup.exe on the data carrier provided. It runs under Windows 9x/2000 and NT.

Download url: <http://www.nico-tech.com/download>

## 4 Device Description

The 1108L is an Analog Output Module for LonWorks network in building automation. Its peripheral scope has been specially designed for the use as valve controller for device spreading control of applications such as valve control or lighting control.

For the use in building automation control the 1108L Analog Output Module realizes 8 independent output channels.

The LonMark object available per channel flexible use of the 1108L; Furthermore there are several Network Variable Type Translator functions for the operation by network variable type translator function. The configuration of the building automation application is effected via any LonWorks network management tool.

Of course, the 1108L Analog Output Module is also freeing programmable in Neuron C. As a flash module is used the application can be load via the LonWorks network, making the 1108L an I/O controller, e.g. for detail info please contact: [Thomas@nico-tech.com](mailto:Thomas@nico-tech.com)

### 4.1 Hardware Survey

The 1108L Analog Output Module disposes of eight output circuit for each. The output circuit can be controlled individually output 0~10VDC@20mA

### 4.2 Operation and Display Elements

The 1108L Analog Output Module is fitted with a service button accessible via a small gap on the front panel (see Figure. 1.1, **8**). Activation of the buttons generates a service-pin message transmitted via the LonWorks network. The processor status as well as the service-pin status are displayed by the service LED (figure. 1.1, **A**), which is on while the service button is activated. By use the network management function Wink the service LED flashes.

Furthermore the 1108L Analog Output Module is fitted with a reset LED (figure. 1.1, **B**), displaying the availability of device occur reset. The LED is connection to an I/O pin of the Neuron chip processor.

### 4.3 Connection Pin Assignment



The following tables show the connector pin assignment of the individual connectors. Connections the **1** marking cf. Figure. 1.1 On previously page. In each clamp block pin 1 is situated on the left. For further wiring information see figure 3.2.

### LonWorks Network Connection

The double-core bus line can be connection either to **LON A** or to **LON B**. No polarity has to be considered by connecting the LonWorks network.

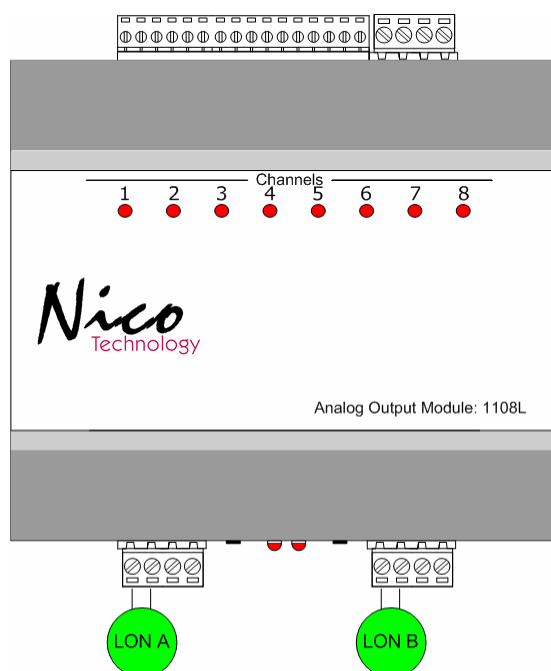


Figure 3.1 Connector pin assignment LonWorks network

## Output circuit

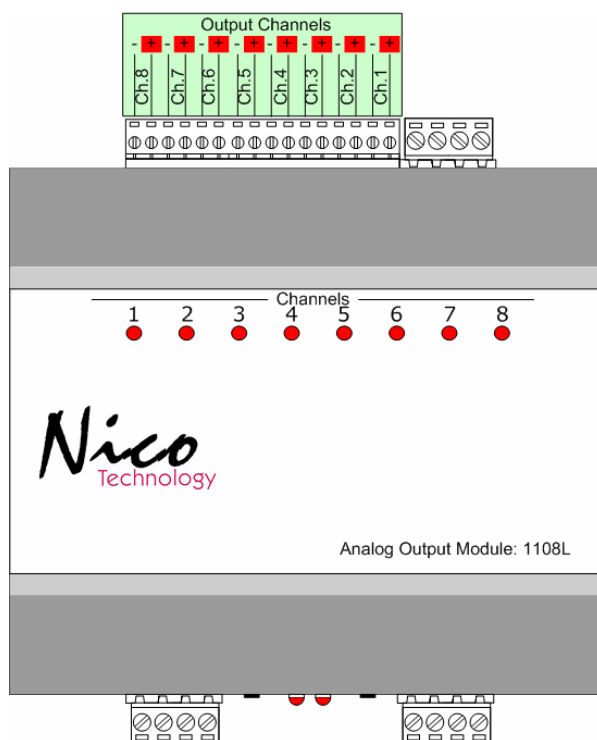


Figure 3.2 Connector pin assignment output circuit.

## Power Supply

The 1108L Analog Output Module has to be connected via connector 2, 3, 5, 7 to 24VDC main voltage. Also see figure. 1.1.

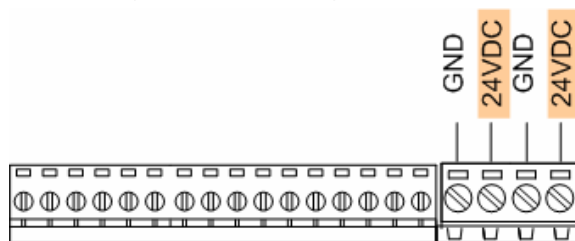


Figure 3.3 Connector pin for Power Supply near output channels side

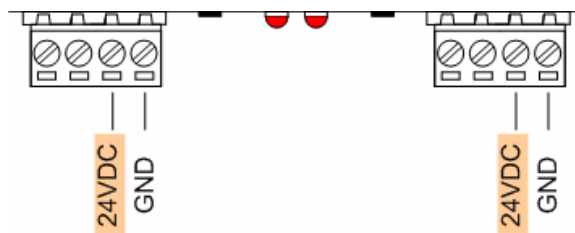


Figure 3.4 Connector pin for Power Supply other side

## 4.4 Wiring Diagram

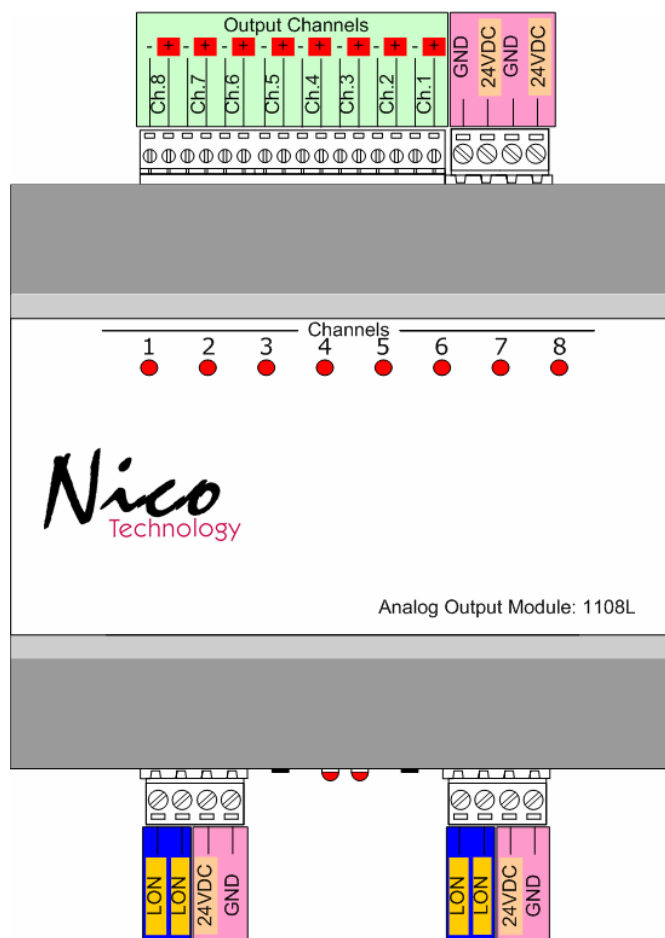


Figure 3.5 Connecting to 1108L

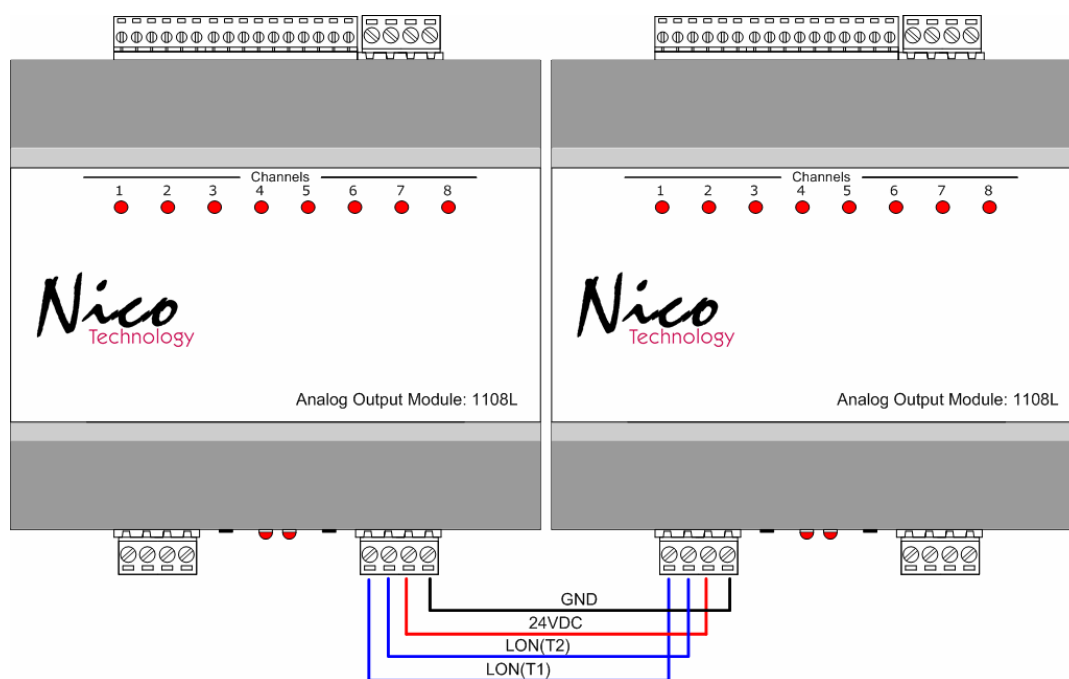


Figure 3.6 Connecting to other one of 1108L or LonWorks device

#### 4.5 EMC

The 1108L Analog Output Module is a CE certified device according to the regulation 89/336/EEC for electron magnetic compatibility, modified by 92/31/EEC". Concerning the emission it fulfills classification B (living area) according to EN 55022A/B, EN 55011 A/B and EN 50081-1/2 and, concerning the interference sensibility, classification A (industrial area) according to EN 50082-2.

#### 4.6 Technical Specifications

CPU	Echelon Neuron 3150,10MHz	
Memory	64Kbytes Flash memory, 512Bytes EEPROM,2Kbytes SRAM,8Kbyte external SRAM	
LonWorks Transceiver	FTT-10A/FT-X1/PL-3150	
Power supply	24VDC	
Power consumption	20mA(Per channel maximum)	
Connection	Plug-screw clamp 2.5mm for output channels, 3.0mm for DC power supply and LonWorks network communication port.	
Temperature	Operation	0 ~ +50
	Storage	-20 ~ +70
Admitted relative humidity	5 ~ 93%, non condensing	
Dimensions	135 x 120 x 55 mm, DIN 43880, incl. clamps	
Mounting	DIN rail(EN 50022, 35 x 15)	
Display & Operation	Service-pin and Reset LED indicator and button	
I/O Channels	8 analog output channels with indicator.	

Table 3.1 Technical Specification

#### 4.7 Dimensions

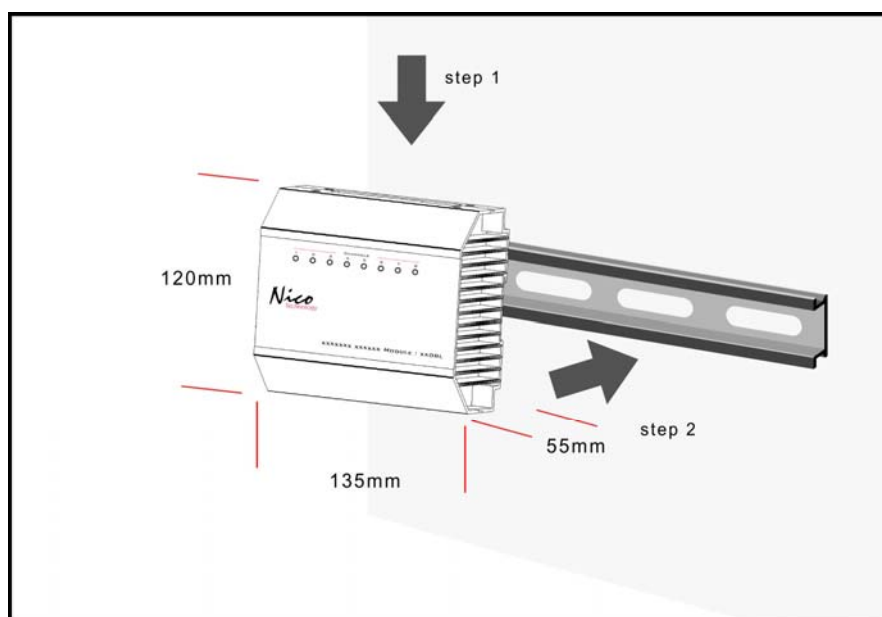


Figure 3.5 Device dimensions without plug-screw clamps

## 5 Application Software for Building Automation Control

On the 1108L Analog Output Module an application for building automation control is implemented, making output functionality as well as analog control functions available.

Therefore the relevant LonMark profiles stated in Table 4.1 are implemented. The use of network variables (NV) compiles with the LonMark standard. SCPT's are used for parameterization by applying the read/write-memory method.

Title	Present Version	Identification
LonMark Application Layer Interoperability Guidelines	V3.1	078-0120-01D
The SNVT Master List and Programmer's Guide	V 8.0	
The SCPT Master List	V 8.0	
LonMark Functional Profile Analog Output	V 1.0	0521
NV Type Translator Object		

Table 4.1 Referring document about LonMark profiles

### 5.1 System Scope

The 1108L Analog Output Module is equipped with eight channels for Analog Output.

The analog outputs of the 1108L Analog Output Module allow the connection of actuator. An Analog Output (AO) object, according to LonMark Standard can be assigned to these output and configured. Furthermore the 1108L can act as constant valve controller. The valve control either generated by the internal AO object; via an input network variable.

The 1108L is equipped with eight analog outputs circuit to connect e.g. valve, dimmable ballast.

## 5.2 Interoperable Interface

The LonMark profile *0521* is realized in the 1108L Analog Output Module. The network interface remains standardized, clear and especially it is interoperable. That means, the 1108L Analog Output Module can be used in connection with network components by other manufactures. The following table contains a survey of the network variables defining the 1108L Analog Output Module network interface and their assignment.

NV Name	Type	Allocated Object
nviAnalog	SNVT_lev_percent	Analog Output Object
nvInput	SNVT_lev_percent	Nico Tech NV Type Translator Object
nvOutput	SNVT_lev_percent	Nico Tech NV Type Translator Object

Table 4.4 Allocation of NVs and LonMark objects

Under the order code 1108L a data carrier containing the interface describing file **Nico\_AO-1108L\_R1.XIF** and the application **Nico\_AO-1108L\_R1.APB** is provided free of charge at simultaneous purchase of a 1108L. The XIF-file is necessary for integration with LonMaker for Windows or any other LonWorks network management tool.

## 6 System Objects

This chapter describes the LonMark objects implemented in the 1108L Analog Output Module. For each it states the network variable les used, special configuration properties, general object properties, response during modification of the configuration and after a reset, and, if available, further object properties.

### 6.1 Node Object

The functionality of the node object is defined in the Application Layer Guidelines of LonMark Interoperability Association ([www.lonmark.org](http://www.lonmark.org)).

#### Network Variables

NV Name	NV Type	Comment
nviRequest	SNVT_obj_request	Status request
nvoStatus	SNVT_obj_status	Status response
nvoAlarm	SNVT_alarm	Alarm generating
nvoFileDirectory	SNVT_address	Address of file for parameterization

## 6.2 Analog Output (AO) Object

### Network Variables

NV Name	NV Type	Comment
nvoAnalog	SNVT_lev_percent	Analog Percent of output

### Configuration Properties

CP Name	CP Type	CP Index	Comment
SCPTdefOutput	SNVT_switch	7	Default output
SCPTovrBehave	SCPTovrBehave	32	Override behavior
SCPTovrValue	SCPTovrValue	33	Override value
SCPTobjMajVer	SCPTobjMajVer	167	Read only; Must read from device
SCPTobjMinVer	SCPTobjMinVer	168	Read only; Must read from device
SCPTmaxRcvTime	SCPTmaxRcvTime	48	Receive Heartbeat
location	SCPTlocation	17	Additional free comment



### 6.3 Nico Tech. NV Type Translator Object

#### Network Variables

NV Name	NV Type	Comment
nvInput	SNVT_lev_percent(default)	Type translator of Nv input value
nvOutput	SNVT_lev_percent(default)	Type translator of Nv output value

#### Configuration Properties

CP Name	CP Type	CP Index	Comment
SCPTnvType	SCPTnvType	254	Nv Type of nvInput
SCPTnvType	SCPTnvType	254	Nv Type of nvOutput
SCPTmaxNVlength	SCPTmaxNVlength	255	Read only; Maximum Nv type length of nvInput
SCPTmaxNVlength	SCPTmaxNVlength	255	Read only; Maximum Nv type length of nvOutput
SCPTobjMajVer	SCPTobjMajVer	167	Read only; Must read from device
SCPTobjMinVer	SCPTobjMinVer	168	Read only; Must read from device
SCPTtrnsTblX	SCPTtrnsTblX	28	Used in conjunction with Translation table X to scale and linearity a value
SCPTtrnsTblY	SCPTtrnsTblY	29	Used in conjunction with Translation table Y to scale and linearity a value